A Work Project, presented as part of the requirements for the Award of a Masters Degree in Management from the NOVA – School of Business and Economics.

MANAGEMENT CONSULTING LAB – PORTUGAL VENTURES

STRATEGIC ASSESSMENT OF PORTUGAL VENTURES' LIFE SCIENCES PORTFOLIO

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ABSTRACT

This paper intends to present the Management Consulting Lab project developed in partnership with Portugal Ventures. The project has benefits for both students and the client: for students it is an opportunity to gain an innovative learning experience in a real-life setting and apply methodologies learned to solve problems; it also gives companies access to high-quality and cost-effective consulting projects and a young talent pool with new ideas and frameworks. The client's challenge required thorough analysis to produce several deliverables to the client including a set of recommendations for future implementation based on the team's main findings.

Keywords: consulting; Portugal Ventures; Life Sciences; biotechnology.

CONTENTS

1. CONTEXT

The Client

Portugal Ventures (PV onwards) is a fund manager that operates the investments of the Portuguese State in several areas. It was born in June 2012 as a result of the "*merger of three of the most representative Venture Capital & Private Equity Portuguese firms whose shareholders include both private and public entities*"[1]. It has four Business Units (BUs): Seed Innovation Capital; Venture Capital; Private Equity; and Tourism, Hospitality & Leisure[2]. One of the main objectives of PV is the improvement of the competitiveness of the Portuguese economy and the investment in industries and sectors that can compete globally, with cutting-edge technologies. PV is currently managing a fund of approximately € 600 M and has a portfolio of companies in several industries; its focus is in startups in life sciences, information technologies, communications, electronics, the web, and agribusiness[3]. The unification of the three VC funds allowed for a better resource allocation and also for a mindset change. Whereas before the creation of PV the funds' management was not articulated among the three funds and its main objective was to provide a public service for entrepreneurs, the formation of PV brought a different orientation. PV is now a results-oriented fund manager and even though it has the objective of enhancing the Portuguese economy it realized that it mustn't be done at the expense of the Portuguese tax-payers. Companies in which PV invests have to pass through a selective process, present high probabilities of success, a high return on the investment, and also the promise of spreading the future benefits of the project to the economy. The country's current economic situation required such a change in mindset and the leadership board of PV is representative of that: Prof. José Epifânio da Franca (Chairman & CEO) is a successful entrepreneur himself; and Dr. Luís Filipe Lopes (Deputy Chairman) has made his career as a consultant at Roland Berger. These two personalities were the main drivers of the new business orientation of PV and were the most important stakeholders of the team's project.

[1] 'Investor's Guide – Incentives to Investment – Venture Capital'. aicep Portugal Global, accessed January 11th, 2013. <http://www.portugalglobal.pt/EN/InvestInPortugal/investorsguide2/investmentincentives/Paginas/VentureCapital.aspx>

[2] About us – Business Units. Portugal Ventures, accessed January 2nd, 2013. <http://www.portugalventures.pt/en/contents.html?hrq=195>

[3] 'Portugal launches a €600 million venture capital fund'. Algarvedailynews.com. accessed January 11th, 2013. <http://algarvedailynews.com/news/6811-portugal-launches-a-600-million-venture-capital-fund>

The Challenge

PV's portfolio contains companies in different industries and sectors. For this consulting project, PV required the teams to re-evaluate the strategy of most of the Life Sciences' companies in the portfolio. The reason being that in some of these companies, investments have been made 7 years earlier and the overall success of the companies was somewhat behind expectations. Initially, the portfolio was composed of 16 companies (see Appendix 1) however, the team focused on 10 companies that operate in industrial biotechnology; pharmaceutical biotechnology; pharmaceuticals and healthcare; and also a venture capital fund specializing in biotechnology (see Appendix 2). These companies were mainly inserted in the Venture Capital BU of PV, but some of them were also seed investments and were inserted into the Seed Innovation Capital BU, in any case all companies can be considered SMEs (Small and Medium Enterprises).

The challenge was to investigate each company as thoroughly as possible in order to determine their main strengths and valuable assets and to define an integrative strategy for the portfolio, with the intention of achieving success through the development of partnerships and synergies between them. This comprised also the study of each company's individual weaknesses and main challenges that needed to be overcome. Some of the companies were facing scale problems, were others had failed the proof-of-concept stage and were now pursuing new projects to become profitable and survive in the marketplace, there were also a subset of the companies that were still very young and were still in the proof-of-concept stage.

The Market

The Life Sciences sector in Portugal has been an unexpressive one, even though there are a few companies in the country all the players need to build international presence in order to survive. Scientific discoveries are usually the foundation for start-ups, however, there seems to exist a very high mortality rate that is more prone to be seen at the stage when companies try to commercialize their products/services in the market. However, Universities and other Institutions for scientific research and education are playing an important role and are redefining the approach scientists take on their research projects to

become more market-driven (see Appendix 3). As a state institution PV plays an important role in supporting the development of new enterprises through its investments in venture capital and seed funding to projects.

The Consulting Project

As mentioned before, the project intended to develop an assessment of the companies in the portfolio and their strategic options to become successful. Taking this into consideration and given that PV has a legal restriction of not investing in a company for more than ten years the team spent approximately 10 weeks in the PV offices developing a new strategic approach for the portfolio. After being assigned with a room to work, the team was also given access to PV staff that was in charge of providing information about the companies as well as access to other people that could provide the team with valuable information for the project. These staff members were also part of the Committees that assess and evaluate the development of some of the investment projects in the portfolio so they were crucial in answering the team's questions. Given the technical details of the pharmaceutical and biotechnological industries the access to people and information were critical aspects for a good development of the project.

2. REFLECTION ON THE WORK DONE

Management Consultancy and The Life Sciences Project at Portugal Ventures

Management consulting was defined by Greiner & Metzeger (1983) as "*an advisory service contracted for and provided to organizations by specially trained and qualified persons who assist, in an objective and independent manner, the client organization to identify management problems, analyse such problems and help when requested in the implementation of solutions*". Consultants play an important role in business administration by contributing to the performance improvement of companies. Organizations contract services to consultants usually to solve a problem so the first tasks a consultant has is to formulate and structure the problem in order to define the outcomes that need to be achieved to solve it (Earll & Bath, 2009). A crucial skill in a consultant is, therefore, the ability to ask questions and understand the client's problem (Macdonald & Simpson, 2001).

As mentioned before, PV had invested in a portfolio of companies in the Life Sciences sector and it was now facing a situation in which the problem was undefined: some of the previous investments have proven to be unsuccessful and exit was an option that would imply the loss of all the amounts invested as well as the possible closing of these projects. PV had also a sensitivity problem when it comes to personal attachments to the projects (both from the promoters themselves as well as PV staff that closely accompanied the evolution of projects throughout the years). Therefore we can understand that even though PV acknowledged that some projects were negatively affecting PV and needed to be revolutionized (by closing or incorporating them into others) they lacked the tools to define the new framework of the portfolio.

For the purposes of this Work Project report, two of the different aspects of a consulting project were chosen and will now be examined, firstly a conceptual approach to each of the aspects, followed by an analysis of the project's process in light of that aspect, and finally a reflection of the main takeaways and lessons learned during the project. The aspects that will be analyzed are: information gathering and data processing in a real-life business environment; and techniques for writing reports and communicating conclusions and recommendations.

Information Gathering and Data Processing in a Real-Life Business Environment

A conceptual approach

Put it simply, in order to correctly define the problem a consultant need to enter the company and start asking questions, this process of collecting information involves the client's staff and can also make use of its informal network. Sometimes, the simple fact that an external consultant is present in an organization can trigger change processes (Kubr, M. (ed.), 2002), the consultant should focus on defining purposes rather than on pointing fingers at what's wrong (Nadler & Hibino, 1994). Therefore consultants should start by asking what is the end game of the situation, or what is trying to be accomplished and define the facts that are desirable. Gathering information can be costly and time consuming;

there are virtually unlimited amounts of information that can be taken into account and it can easily become excessive.

Obtaining information can be done through several means and using different sources, these can take a more formal or informal look. One of the more common ways of gathering information is retrieving publicly available information on the Internet, which represents one of the primary sources of information but it is also the one that requires more work to determine its usability. Information can also come from the client's formal network: through reports and previous publications; files existing in the client's database; as well as reports and notes from other attempts to solve the same or similar problems. However, significant information can also be collected through the informal network: by observation of the organization's day-to-day operations; observation of the work dynamics within the organization; and through realization of data-gathering meetings and interviews with the client's staff (Kubr, M. (ed.), 2002). Other forms of information gathering can be the performance of surveys, questionnaires or meetings with other external players (outside of the client's staff).

Conversion of all information to meaningful data requires thorough analysis in order for the consultant to be able to correctly diagnose the client's problem. A first approach to data analysis and processing is the screening and editing of raw data; verifying its clarity and classifying the information by different criteria (Kubr, M. (ed.), 2002). With clear and organized information, the consultant can use different techniques for identifying relationships and trends, these will depend on the nature of the information: quantitative and qualitative techniques. Quantitatively a consultant can use statistical methods, ratios and rankings, mathematical and graphical modeling. To analyze information qualitatively a consultant can use causal analysis, comparisons, and other conceptual models developed to examine relationships between factors.

The project's process

In the case of PV's project, the first task was to understand what the Life Sciences sector is and what the companies in the portfolio do. At this stage, the team still had no access to

PV's staff or privileged information so the Internet was the only resource for information. Recall that most of these companies were still at their inception stage and information about each company was scarce – this consisted of the first and main limitation of the team to perform a first diagnosis of the portfolio. With the evolution of the relationship between the team and the client the team had access to some of PV's internal documentation about each company however this information was most usually not clear about each company's current state and its strategy for the near future. To better understand the documentation some meetings were scheduled with internal staff of PV that were responsible for following the companies, this was the first opportunity the team had to ask questions that were not answered in the reports. At this stage the team started to recognize that in the case of some of the companies even PV had no information; for some companies PV's staff was still waiting for the promoters to send updates on the operations of the company. Due to sensible relationship issues the team was not authorized to contact the company or the promoters which allied with the lack of information inside PV represented a major issue that compromised the accuracy of the diagnosis. The first round of interviews established the first contact with the person responsible (analyst) for each one of the companies and opened connections for future questions the team might ask – by knowing who was responsible for each company the team knew to whom should direct specific questions. A marking point in gaining new insights about the companies' situation was when the team performed interviews with external personalities, these people were chosen by PV's staff as people that could provide information about the Life Sciences sector in general. For most of the cases the team presented itself as a group of students and gave no connection to PV, that allowed the team to understand and speak openly to people that had criticisms about PV and its portfolio. That information (both explicit and tacit) added light into the data that the team already had about the companies in order to analyze the companies' performance.

To analyze all the information collected the team developed several tools. Quantitative information was limited and was mainly related to financial data, number of employees, and number of patents. This information was analyzed mainly through the usage of graphics and matrixes to compare companies, and using ratios. To analyze qualitative

information the team developed several criteria that could be applied to any company, the purpose was to rank each company in each of the different components of these criteria (see Appendix 4 and Appendix 5). The creation of the criteria itself was a process that entailed long hours of work and discussion within the team and also with the PV analysts that were following the team. The objective of the criteria was to transform the general opinion of analysts about a company into a number that allowed for quantification and comparison. So within each criterion (e.g. team's skills) there was a new subset of criteria arising (e.g. management skills and scientific skills). To reach a consensus it wasn't possible to include all criteria possible and the team decided to analyze only the ones that when studied could reveal important insights. Later, the team designed a matrix with all the criteria and all the companies that was ranked by the team; the opinions of the team were then sent to all the analysts of each company with a request for validation or alterations of incorrect rankings. The final result is the table presented in Appendix 5. By using this tool the team was able to plot various graphics and compare companies in different dimensions so that struggling companies or outperforming companies would stand out, on Appendix 6 is an example of how crossing the companies' classification in three different dimensions provided some ground basis for a clearer definition of PV's problem.

Lessons

The process of gathering and analyzing information is not a passive one. Consultants need to be persistent in asking for more information and questioning the information given until they have their answers cleared. An example of a moment that represent an important lesson is the interview to Dr. Peter Villax[4], in this interview Dr. Villax was very critical on the guidance of the interview. In his point of view, the interviewer must do much of the research work before the interview and consider every fact and every position that can be possible for a given topic and at the moment of the interview he/she must only confirm the information that was already gathered and process it. An interview is, therefore, an opportunity an interviewer has to match data that was already processed with the

[4] Dr. Peter Villax is the Vice-President of the Pharma Business Unit and Innovation of Hovione, one of the largest pharmaceutical companies in Portugal.

interviewee's point of view in order to formulate more informed conclusions. Also, the consultant has a privileged position, since it is external to the client is in a better position to understand and absorb the criticisms of other external players. However, consultants need to be creative when analyzing all the different views and opinions collected, the consultant needs to be able to differentiate between objective information and biased information and investigate deeply into the organization in order to make a proper diagnosis of the problem. At the same time, the consultant needs to be able to maintain a position that does not compromise the outcome of its work and treat information impartially.

Techniques for Writing Reports and Communicating Conclusions and Recommendations

A conceptual approach

Consultants are required to provide clients with impartial advice after studying the client's problem and opportunities to tackle it. The end-game of the consulting project is therefore to present the conclusions of the consultant's study and the main recommendations based on those. A hierarchy of purposes of management consulting services helps consultants to understand the scope of a project and to perform accordingly to the client's needs (Turner, 1982). Such end-game usually takes the form of a written report or a presentation that needs to be clear and convincing, so that managers in the client's firm feel the need to implement the consultant's recommendations. Advice given from consultants has, therefore, to contain "*information that is new to the client, and yet still sufficiently recognizable for the client to know what to do with it*" (Macdonald & Simpson, 2001). Management consultants can be characterized as providing a "bridge" that provides know-how to fill managerial gaps, working as "knowledge integrators" (Canato & Giangreco, 2011). A very important aspect of giving advice to clients is related to the relationship that is built with them; if there is a strong involvement of the client in the consulting project there is a better opportunity for the consultants to understand the real problem of the client and the purpose of the project and therefore deliver recommendations that are aligned with the client's framework. Turner (1982) has given examples of how a consulting firm may fail a project and produce sounding reports with impractical recommendations because it doesn't take into account

aspects such as legal frameworks, employment conditions or other relationships that compromise the implementation of the recommendations. Therefore, consultants need to create a commitment with the client and build a consensus between what needs to be done and what can be done to improve the situation. The techniques that the consultant uses to involve and influence the client are many, however, counseling or "active listening" techniques can prove to be most effective (Sturdy, 1997). These two techniques are not mutually exclusive; in fact, they can appear in different stages of the project. Actively listening can be a starting point for the consultant to acknowledge the client and understand what will be the best approach and avoid early rejection of counseling practices. Other techniques can be the demonstration of technical expertise; personal integrity; knowledge sharing; assertive persuasion; and the development of a common vision; developing participation and trust; using rewards and punishments; and using tensions and anxieties (Kubr, M. (ed.), 2002). Another important aspect of the process of delivering conclusions and recommendations to the client is the identification of the key stakeholders in the project and their vision of the problem (Sturdy, 1997), this can serve as a tool to eliminate options that are not viable in the view of the most important stakeholders of the project and it also serve to measure the impact of recommendations and its acceptability among the stakeholders. Recommendations need to be presented in a persuasive manner with the proper balance of analytical skills. The result is a set of measures that are tailored to the client's sector and organization that provide a solution to the client's problem and represent one that the client has a real option to put into practice.

The project's process

Since the beginning of the project the team understood that the portfolio in general was struggling and that the opinions about the future of the portfolio within PV were differing. The first steps of the team were to identify the stakeholders of the project; these were the Board of Directors, and the different BUs Directors and Analysts that were responsible for the investments in each of the companies in the portfolio. In each one of them the vision of the problem was different; whereas the directors wanted a global solution that would involve all companies, analysts argued that companies were different and had their own

characteristics that made it almost impossible to treat the portfolio as a whole. The team sooner found out that both part's viewpoints were possible. Therefore, in order to be persuasive and to be able to construct a set of recommendations that the client perceived as a natural step in the evolution of the portfolio, the team had to always bear in mind the two differing thoughts. The initial emphasis on actively listening included not only the perceptions from inside the organization but also (as already mentioned) perceptions from the outside that equipped the team with new ideas that were brought inside to the client. By engaging the client in several steps of the project the team had the opportunity to test the differing opinions that existed and by listening to the critics of the client to the different opinions it was possible to draw the perceived best route for the portfolio.

The team also had the opportunity to investigate the state of the Life Sciences sector in Portugal as well as in the world, the presentation of the team's findings marked an important point in the evolution of the project because that consisted mainly of new information for the client and it was an opportunity to redesign the project according to the market possibilities. Even though PV had already a perception of the situation of the Life Sciences sector before it became clear after the team's presentation that the companies' performance was also dependent on the performance of the sector in general and that was important to improve the international perceptions that big companies had of the industry in Portugal. This stage also marked the creation of a consensus with the client for the purposes of the companies because it became clear that there was no easy route to transform the companies into profitability.

The team's recommendations and the client's perception of what was possible to be done with the problem started to appear more similar and the team entered a stage of counseling about the possible strategies to execute a strategy that involved the entire portfolio while separating the different companies into groups. The client's feedback was also important in this stage because it provided the ground basis for which solutions were possible of being executed and which ones weren't, and what were the resources needed and the degree of change that each strategy chosen required. For the final presentation the team structured its conclusions and recommendations in a way that could be read as a story; the evolution of a

problem. The final presentation was then constructed so that the client itself would reach the same conclusions the team did by going through the same steps of thinking. Techniques used to direct the thought of the audience (the client) were employed so that the recommendations could be accepted, these consisted mainly in explaining clearly and in detail each one of the components of the recommendations while, at the same time allowing space in the implementation stage for some changes. In Appendix 7 is an example of a recommendation that consisted in the integration of several parts of companies into one unit that would foster cooperation between all of them, highlighted is the case of a synergy that has proven to be the most promising. Also, in Appendix 8 is the methodology suggested to PV for the continuation of some of the projects that to be continued would require extra capital.

Lessons

Understanding the client's problem is only the first stage of the consulting project, each organization has different internal dynamics and topics are subject to different interpretations from the various people in the organization. Such sensible topics limit the range of possibilities the team has to present, but by receiving critics the team is able to direct the recommendations to a better position. There were several occasions that can demonstrate the power of testing your recommendations; an example was the scheduling of short meetings (Status Meetings) before every important meeting with the client. There were three Steering Committees that included the Boards of Directors, the Directors of the BUs involved in the project and the Analysts also involved in the project. These committees represented a formal situation for the team to present the conclusions it had so far and next steps to follow in order to develop proper recommendations. Also, Status Meetings were held a few days before each steering committee and included only the Deputy Chairman and the team of two Analysts that was closely involved with the team of consultants; this was a more informal meeting meant to test the conclusions and ideas the team had prepared for the Steering Committee. Such Status Meetings are an example of the feedback the team was able to have before presenting the conclusions achieved to the client's committee. When the client can have constant updates on the project's status and

the team has also constant feedback from the client the process becomes more fluid; conclusions are obvious results of the situation encountered that represent logical arguments to recommendations, these appear as a natural step that needs to be followed towards the organization's success.

3. REFLECTION ON THE LEARNING

As a student, a consulting project such as this represented a unique opportunity to enter a real-life business environment, but more than that it represented an opportunity to learn as much as possible about an industry. This is a very important feature for a student that is trying to define a career path to follow and therefore wants to make the most informed choices, based on hands-on experience in different industries. A project such as the Management Consulting Lab is one that contributes positively to students that are choosing a career path and want to have the opportunity to explore alternatives in a controlled environment.

Previous Knowledge

Naming someone as a consultant can mean several different things, a consultant gives advice on all possible topics in which it has knowledge for it, and sometimes the advice is not directly related to knowledge in the industry and practices but on the processes or any other non-related topic. Basically anyone can be a consultant. To become a management consultant one needs only some ground knowledge of business in order to understand the purpose of a project. This means most of the skills that are necessary for a consulting project are not learned in a Business or Management Degree, a consultant needs to be keen on soft skills rather than on hard/technical skills. Technical skills can be easily learned with some degree of effort and dedication, for most consultants they are learned on the job (Greiner & Ennsfellner, 2010). However, soft skills such as creativity in problem solving and interpersonal relationships are crucial because they are the ones that help people understand and define the environment surrounding them and also give the consultant the capability to adapt to each client and environment. Analytical skills represent a toolkit that is important in order to have a better diagnosis of the problem and a better understanding of

what is necessary in a suitable solution. For this project among the knowledge applied from the university are mainly concepts of corporate governance and corporate strategy, analysis tools such as SWOT and BCG Matrix, market research, and data mining tools.

New Knowledge

Apart from the scientific world of pharmaceutical and biotechnology and all the new techniques developed that were already mentioned the project also introduced the team in new management methodologies and techniques. Even though the team had already background knowledge on corporate strategy and on the behavior of a VC or PE investor, the project with PV added light to the concepts learned previously. The concepts of shared services are among the most important in the recommendations of the team; in order to save money, some of the companies PV invested can have a centralized accounting or procurement office, or these tasks can even be performed by companies PV had invested in other BUs of PV. VC funds also have established objectives and management techniques that differ from other corporation's relationships with its subsidiaries and one of the topics where we can see more differences is in the exit options and motives for exit. It is also not uncommon for a VC to sell its ownership of a company to a big corporation – the VC gets liquidity to invest in other companies and the corporation might be achieving a greater scale, diversification, or specialization.

The interview stage of the project was very important in teaching the team on how to prepare and guide an interview. The team was very persuasive with the interviewees in order to accomplish the scheduling of some of the interviews due to the agenda of some of the interviewees. After having an interview scheduled the team researched about the person and outlined questions about topics that would be discussed with each interviewee and also defined topics that could be considered too sensitive and therefore were considered to be avoided during the interview. Another important skill learned during the project is related to business communications and the ability to be persistent to ask for information without becoming inconvenient. E-mail was one of the most important tools used for communication and all elements of the team had to be constantly exchanging information both with PV staff and outside entities (such as associations and industry groups) to require

all sorts of information that most of the times was not handed in without effort. Therefore it was crucial to be persistent in e-mail communications while at the same time maintaining a formal approach that captured the attention and kindness of the reader.

Delivering information and producing presentations for clients was most likely one of the skills that the team developed, not only to use unknown software tools in Microsoft PowerPoint® but also to produce slides that could contain as much information as possible without overloading the page or confusing the reader. The simple position of a sentence or an image in a page can change the entire interpretation of what the information the page in meant to induce; graphics can transmit loads of information to readers but it's the authors competence to build the page in order to guide the attention of the reader to parts of the graphics in order to achieve the conclusions intended. That can be achieved with the use of informative titles that don't just state the topic discussed. Also, the entire presentation needs to be able to narrate a story that the reader can understand after the meeting; the document needs to be self-explanatory.

Personal Experience

The project was demanding for all team members. First of all it was an industry that until then it was almost unknown and companies developed technologies that were considered to be novel and innovative for which there was almost no information. Personally, the biggest difficulty was related to the topic itself, mostly due to the nature of the sector but also because most of the explanations the team would find about one topic were always either vague or so complex that only brought more doubts and uncertainty to the table. Such scientific unpreparedness I consider to be the main weakness in performing the project, mostly because it often distracted the attention but it also represented a barrier to more deep understanding of the needs, constraints and opportunities of the companies' projects. There were several moments in which the team was too focused on trying to understand the meaning of a concept or what was the basis of a technology that it was missing the most important point that was the added value of the technology or the benefits it could bring to other areas. This means that something that is described using scientific language can be translated into one that has more common grounds with non-scientific language and that

can be done in terms of explaining, for example, the usefulness of the technology, its benefits and applications. On the other hand, when the science concept was understood it became quite clear and simple how that could be maximized and transformed in benefit of other companies. The problem was that the process of translating from scientific language to managerial language was extremely time-consuming. In contributing for this project I was able to add value with the ability to filter the scientific concepts that were relevant to the purpose of the consulting project and translating it into a managerial language. This is a very important aspect when someone is trying to become an entrepreneur.

Another important aspect of any consulting project (and this one was not an exception) is related to the work-life balance and project management skills. Even though there was a time plan for the project, for many different reasons, the schedule had to be changed. This provided the team with project management skills because even though all the elements were committed to the project, there were moments where it was necessary to stay up and work for longer hours than expected, in these moments teamwork and time management were crucial to make the team continue the work and ignore pressure and fatigue.

Benefit of Hindsight

In retrospect, and if the ability to act as a consultant for the next editions of the Management Consulting Lab was awarded to me I would take advantage of the opportunity to engage other schools, such as the Sciences and Technologies' School. This would provide management students a better chance to understand the scientific concepts while at the same time would give science students the experience of how to promote your ideas and explain them to the population in general. This is specifically for the Life Sciences project and does not apply to all management consulting projects developed, but can serve as basis for other projects in other areas that are not directly related to management. The integration of science students, in the case of projects like this also help to enlighten science students that consider develop their own companies in the future on how to explain the concepts behind technology to a general audience in order to attract investors, employees, partners, etc.

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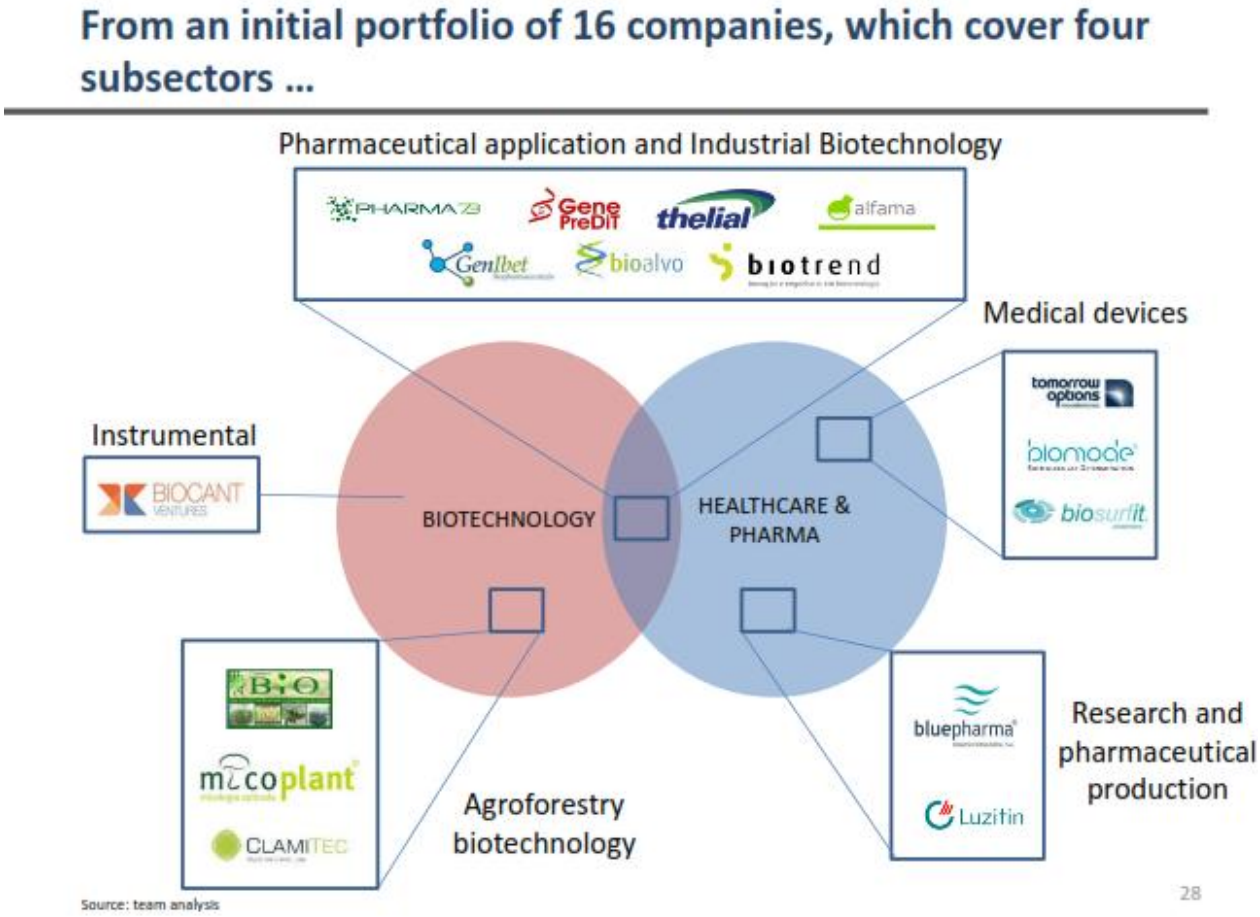
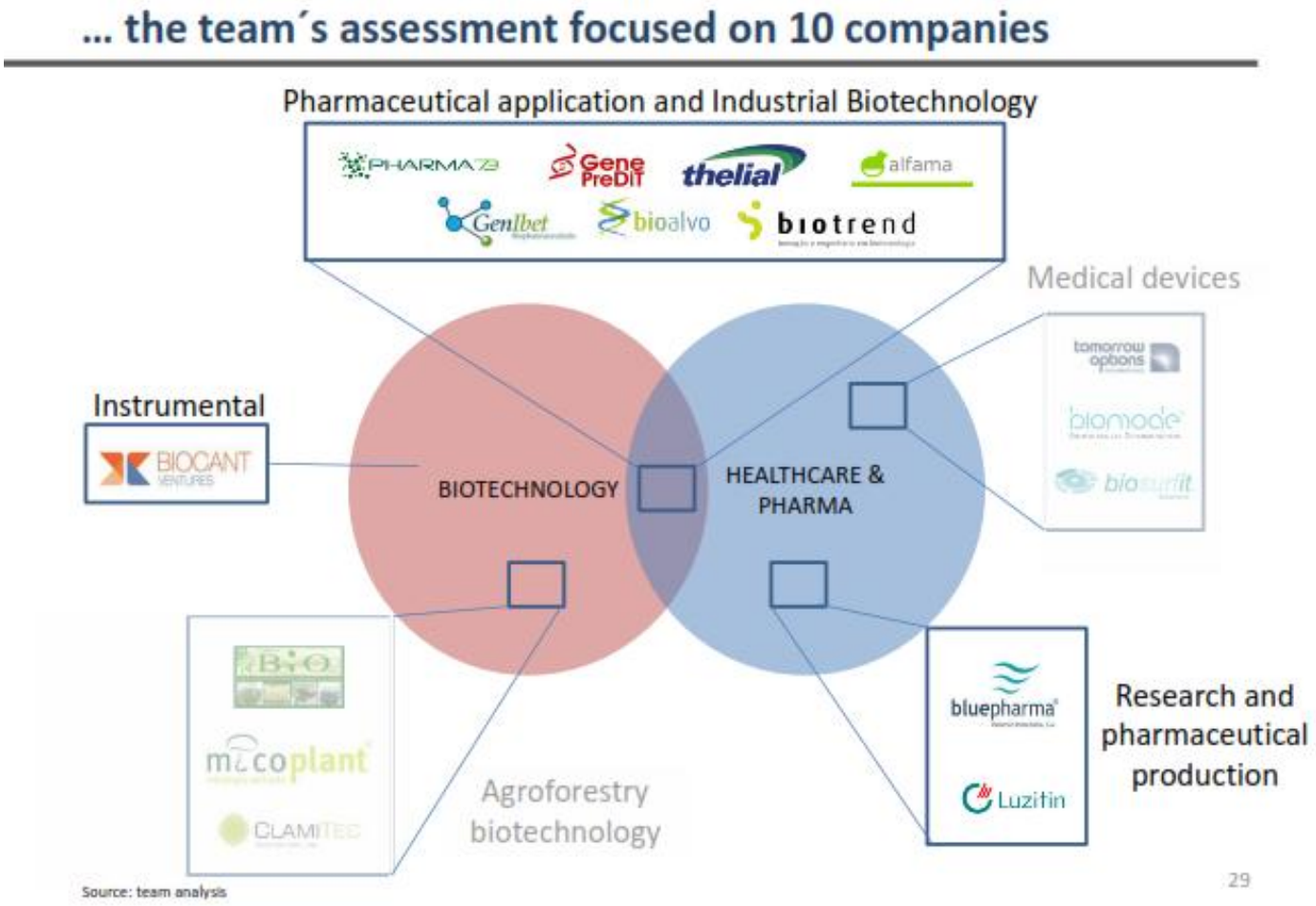
5. APPENDIXES

Appendix 1: The Initial Portfolio of Companies



Appendix 2: The Final Portfolio of Companies



Appendix 3: Team's diagnosis about the Life Sciences sector in Portugal

The Life Sciences sector in Portugal is facing several challenges, but it may enclose a potential that might be worth not to forego

The Life Sciences sector is still young, unstructured and lacks orientation to market results.

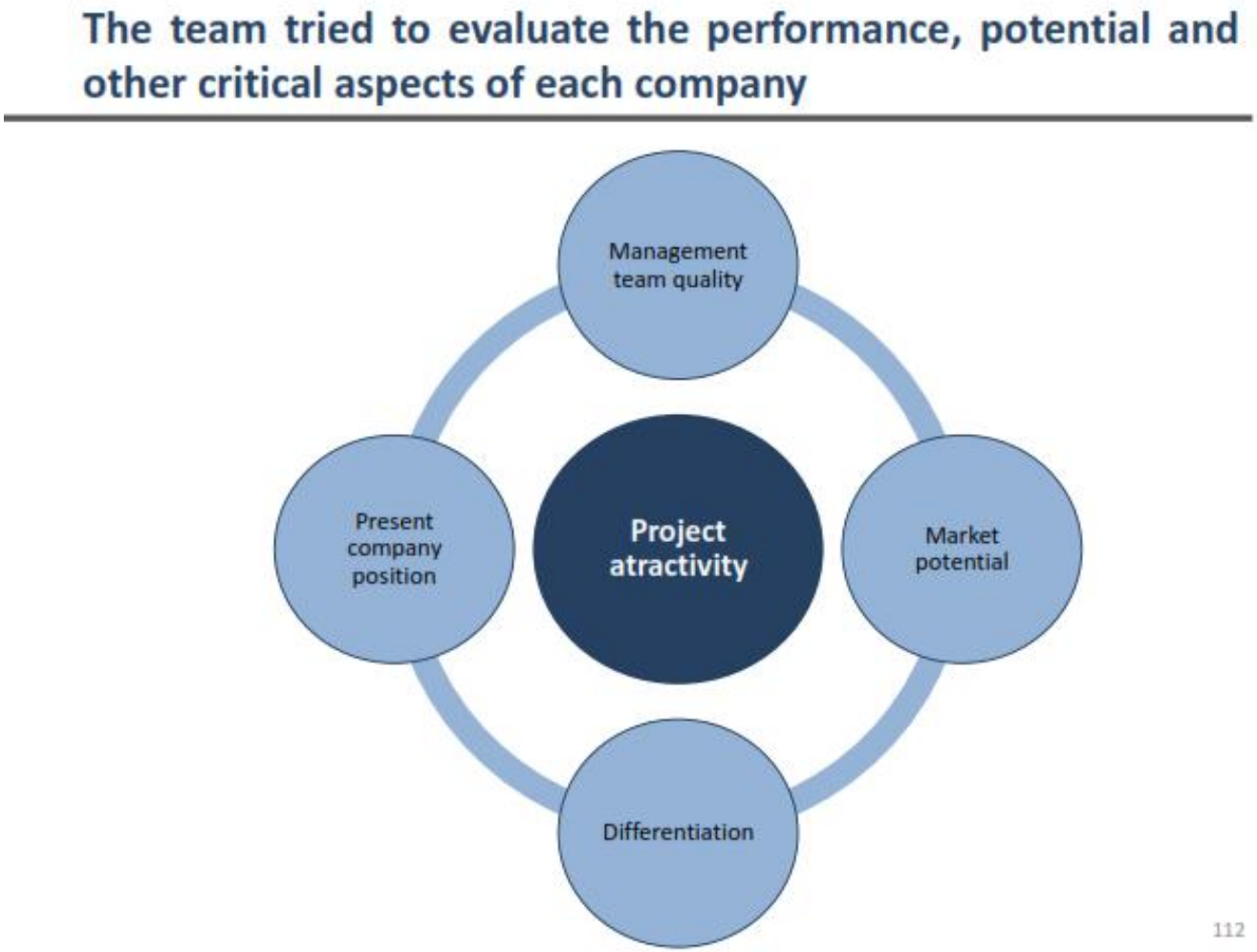
Clusters have not been developed and entrepreneurs don't feel entirely accountable for their projects´ success.

In spite of this, the sector has high potential level of knowledge in three therapeutics areas which are the core focus of several associated laboratories.

Quality infrastructures have already been created with medium-high potential that should be explored for future company generation.

5

Appendix 4: Dimensions of the selected criteria to analyze data about companies



Appendix 5: Classification for each company according to the criteria defined by the team

The final scores for each business are shown in the table below

Each company classification on the different criteria was accomplished according to a specific scale

	Management team quality					Market potential			Differentiation				Present company position				
	Scientific leadership (1-5)	Management Capabilities (1-5)	Corporate Networking (1-5)	Team cohesion (1-3)	Team commitment to project (1-5)	Total addressable market (1-5)	Atomization (1-3)	Rivalry (1-3)	Product's innovation (1-4)	Process innovation (1-4)	Business model innovation (1-4)	Differentiation sustainability (1-4)	Time 2 Market (1-5)	Money 2 market (1-5)	Project execution risk (1-4)	Investment optionalities (1-3)	Shareholder quality (1-3)
Alfama	4	3	4	3	1	5	1	3	2	2	1	4	3	4	2	1	2
Bluepharma	4	5	5	3	5	4	3	2	2	2	1	2	1	1	4	3	3
Bioalvo	4	3	4	3	5	3	2	3	3	3	1	4	1	2	3	1	3
Biotrend	4	3	4	3	5	2	2	2	1	2	1	4	2	3	3	2	3
Gene PreDiT	4	2	2	3	5	2	3	2	3	1	1	3	3	4	2	3	2
Luzitin	5	5	4	3	5	3	3	2	3	2	1	4	2	3	3	3	3
Genibet	4	2	4	3	4	5	1	2	2	2	1	1	1	1	4	1	3
Thelial	5	2	4	3	3	2	1	1	3	3	1	4	1	1	3	2	2
Pharma 73	4	2	3	3	2	3	1	1	2	1	1	4	3	5	2	2	3

Source: PV's internal input, team analysis

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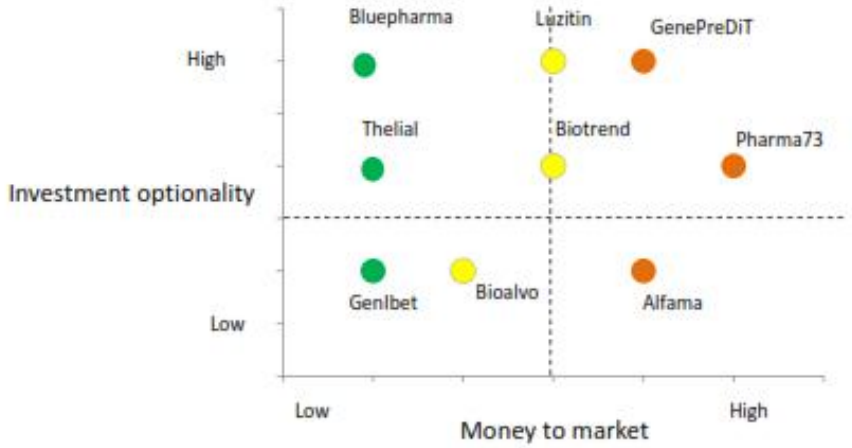
Appendix 6: Example of analysis of companies in different dimensions

Some of the companies in the portfolio present a high investment stake due to high upfront investment needs



Market arrival guaranteed

High probability of market arrival

Low probability of market arrival

Alfama´s investment characteristics seems to make it a very high stake

Although there is flexibility in terms of GenePreDiT and Pharm73´s investment, they tend to be the portfolio companies which require more investment until they reach the market

On the other side, Bluepharma and Thelial appears to be in a more favorable situation due to its low associated risk to market arrival and for its low investment flexibility

Source: Interviews, Internal PV information, team analysis

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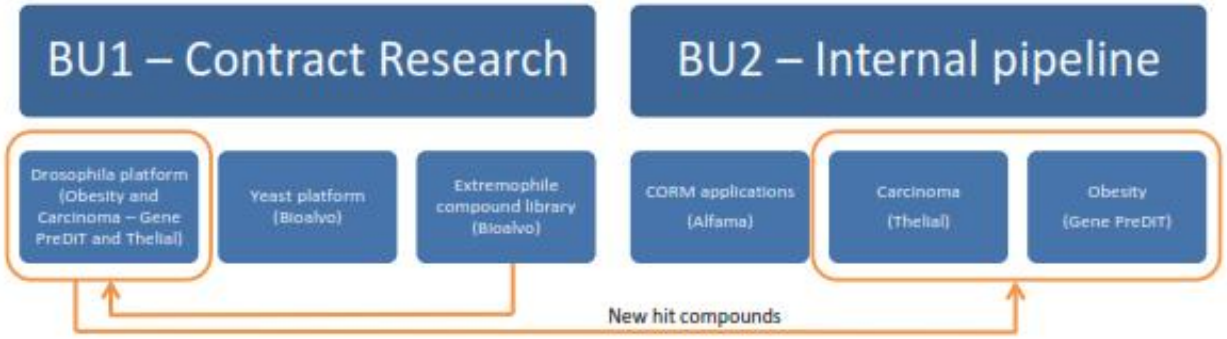
Appendix 7: Example of one of the strategic approaches suggested to PV

Cross-fertilization between Bioalvo libraries and two existing disease models may yield new pipeline projects



Possible synergies:

- Larger scale allows for upgrade of management and commercial structures
- Knowledge sharing and scientific collaboration across projects
- Infrastructure and equipment sharing
- Sharing of scientific assets – compound libraries and disease target models
- Cost cutting across administrative and sourcing functions on all businesses
- Enhanced offer for pharmaceutical clients

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Source: Team analysis

Appendix 8: Decision tree suggested to PV for projects that require more capital